1. $\cos^2(t) = \frac{1+\cos(2t)}{2}$

Prove the above trigonometric identity using simulink. Plot both LHS and RHS on one scope.

2. Model the following differential equation using simulink

   $d^2y/dt^2 + 2*dy/dt + 5*y = 1 \quad y(0)=0$

3. Model the following equations using simulink

$$\frac{di(t)}{dt} + bi(t) = V(t) - K\dot{y}(t)$$

$$\ddot{y}(t) + a\dot{y}\,(t) = Ki(t)$$

   Plot i and y for $V = 2 * \sin(3t)\,, b = 1, a = 2, K = 2.5$

4. Use matlab function block and implement in simulink

   If input > 2.5 output =1

   If input >=0 and <=2.5 , output=0

   For all other values of input output= -1

   Display both input and output in one scope.

   (use repeating sequence stair block as input)